

New Technologies and Precision Application Regulatory Frameworks and Incentives for Innovation

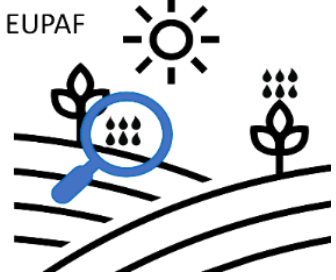
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Chair OECD Working Party on Pesticides Drone Subgroup

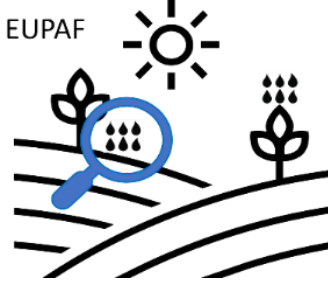
Chair European Precision Application Task Force

(Views expressed here are those of the presenter and do not necessarily represent those of the OECD.)



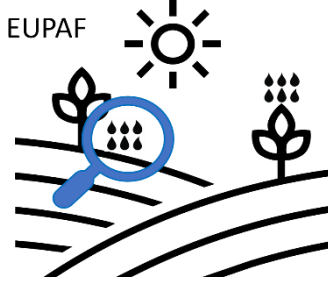
Context and Objectives

- Increasing diversity of new application technology - more respectful of resources and sustainability objectives and wider economic benefits for society.
- Current regulatory risk assessments rely on worst case uses and do not reflect this diversification. Critical to reconcile regulatory assessments with actual conditions of use, in order to: propose meaningful labelling conditions; and encourage further the adoption of sustainable practices.
- EUPAF is a forum for precision application experts (technical institutes, academia, machinery, farmers, authorities and crop protection industry). Will collect scientific data describing precision uses in order to prepare for their recognition in regulatory dossiers and facilitate future risk assessments.



EUPAF - Structure





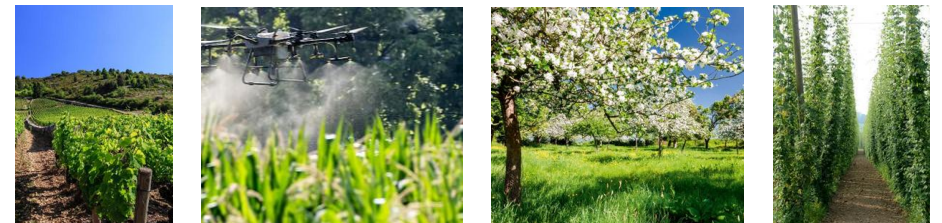
TG1: Identifying PA Use categories and reductions

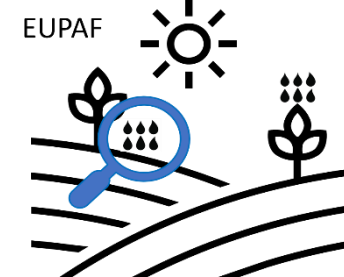
- Identify capability of equipment:
 - Broadcast (standard/reference); band; patch; spot (regular and irregular); and single plant.
 - Constant and variable rate spraying.
 - Prescription mapping and real-time.
- Some evidence to suggest following reductions in use: Band 50-75%; Patch 5-95%; and Spot 50-95+%.
- Can propose use reduction categories:
 - Class A: 95%+ Use Reduction.
 - Class B: 90% - 95% Use Reduction.
 - Class C: 75% - 90% Use Reduction.
 - Class D: 50% - 75% Use Reduction.
 - Class E: 25% - 50% Use Reduction.
 - Class F: 10% - 25% Use Reduction.

Geometry	broadcast	band	patch	regular spot	irregular spot	single plant
pure geometry						
geometry offline						
geometry online						
geometry VRA						
geometry offline VRA						
geometry online VRA						

Like the existing ISO classification system for Drift Reduction Technologies, but with classes appropriate to Use Reduction possibilities.

- [Report](#) available on website.
- Bush and tree crop and drone work also.

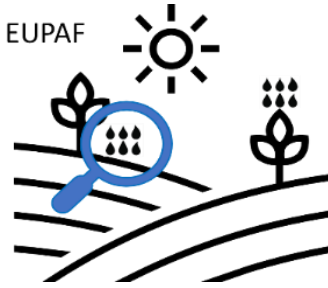




TG 2: Common terminology and GAP tables

- GAP table to communicate proposed precision application use to regulatory authorities.
- Accompanied by Handbook explaining how to construct –on website.
- [Glossary](#) to help establish common terminology for precision application uses – on website.
- Positive feedback from regulatory authorities in Europe (highlights need for case studies).

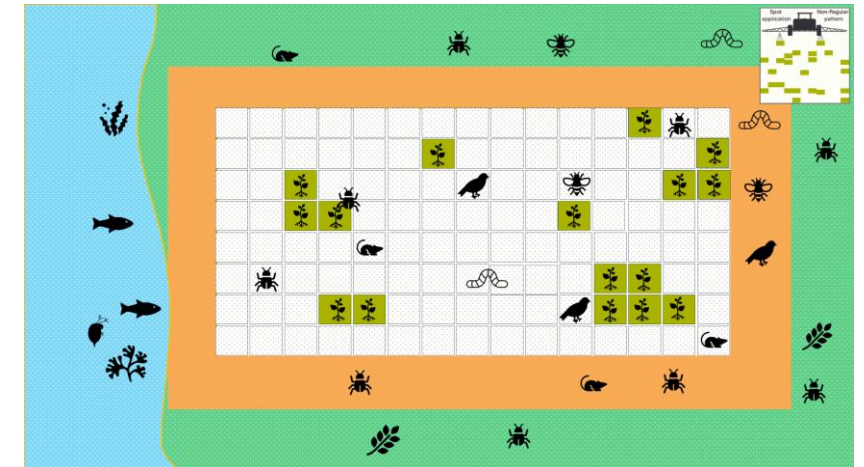
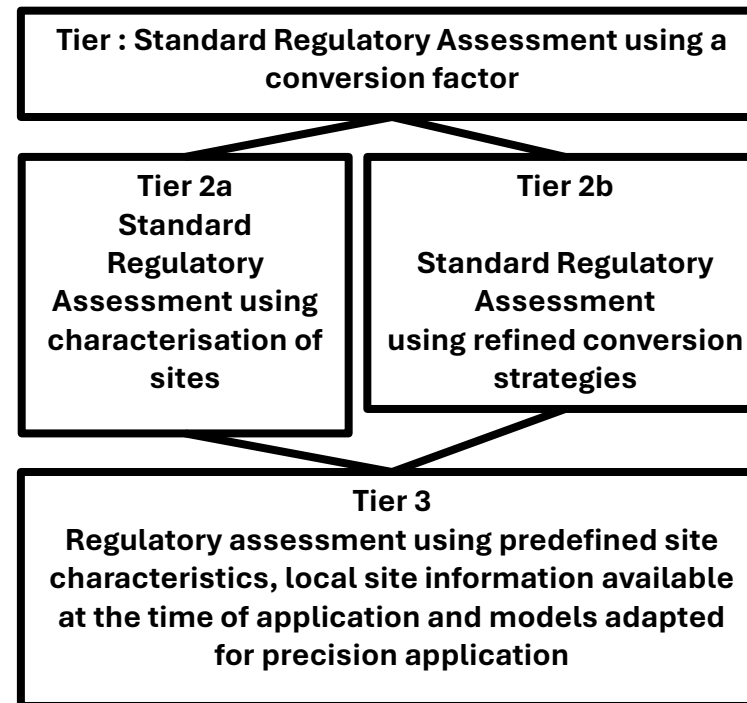
1	2	3	4	5	6	7	8	9	10	11	12	13	14	pictogram
Use- No.	MS	Crop and / or situation (crop destination / purpose of crop)	F, Fn, G, Gn, Gpn, or I	Pest or Group of pests controlled	Method / Kind (dispenser, rate variation, application category, max. area treated)	Timing / Growth stage of crop & season	max numbe r a) b) per crop / season	Min interva l betwe en applic ations (days)	Product (L/ha, kg/ha) a) max rate per treated area (max. field average rate per appl.) b) max total rate per treated area and crop / season / year (max field average rate per crop / season)	kg a.s. / ha a) max rate per treated area (max. field average rate per appl.) b) max total rate per treated area and crop / season / year (max field average rate per crop / season)	Spray volume (L / ha treated area) min - max	PHI (day s)	Remarks:	
1		strawberry (FRAVE)	F	aphids (1APHIF)	band application to the crop row (3TROWM), downward spray and / or sideward spray, constant rate application, map based application, application to maximum of 50 % of field, application exposure: complete crop plants, all crop plants	BBCH 55- 87	1	na	a) 0.14 (0.07) b) 0.14 (0.07)	a) 0.070 (0.035) b) 0.070 (0.035)	500 - 2000	3		
2		sugar beet (BEAVA)	F	Atomaria linearis (ATOMLI)	spot application, regular (EPPO code required), downward spray, constant rate application, real time application, application to maximum 33 % of field, application exposure: complete crop plants, all crop plants	BBCH 10 - 18	1	na	a) 0.075 (0.025) b) 0.075 (0.025)	a) 0.0075 (0.0025) b) 0.0075 (0.0025)	200 - 400			
3		winter wheat	F	grass weeds	patch (EPPO code required), non regular	BBCH 10 - 18	1	na	a) 1.00 (0.50)	a) 0.070 + 0.040 (0.035 + 0.020)	200 - 400			

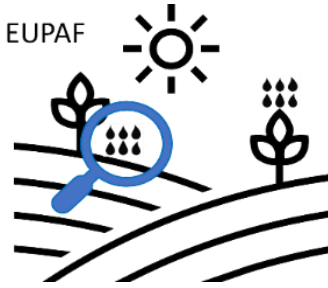


TG 3-4: Adapting risk assessment approaches

- Four subgroups established for parts of the risk assessment (environment, dietary exposure, non-dietary exposure and flexible risk assessment).
- Propose tiered framework for environmental exposure/risk assessment/mitigation
 - conversion factors where risk is directly-related to use.
 - Site characterization/ information and precision application algorithms to overcome current worst-case scenarios.
 - Prescribed longer term site-specific characteristics (e.g. soil, climate, field margins, ecoregions).

- Guidance available on website.
- Does reduced use equate to reduced risk (exposure/effects)? Spoiler alert – depends on factors such location, proximity, duration and degree of exposure, behaviour on non-target organisms.
- Range of illustrative scenarios on website.





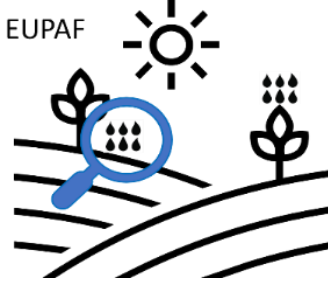
TG 5: Case studies for specific uses

- Support building precision application GAP table language and developping approaches to the risk assessment, based on EUPAF preliminary recommendations. Useful to identify knowledge gaps and how to address them.
- Current work
 - Case study #1: spot control of thistles in sugar beet (24-76% reduction/new and retro-fitted sprayers/remote sensing prescription maps or optical recognition to generate real-time application maps)
 - Case study #2: spot control of weeds in onion with ultra-precision equipment (average 80% reduction/new machine learning technology/treat weeds in or around growing crop),
 - Upcoming case study illustrating band application.
- Consider each area of the risk assessment:
 - Any likely reduction in exposure?
 - Is a conversion factor appropriate?
 - Input into models? (Runoff: SPOT-MOD; Drift: Casanova, SiMOD, IDEFICS; Ecological models eg vole, ELink workshop 2026, etc)
 - Operator exposure and human risk assessment input.
 - Consumer risk assessment.
- Compliance and enforcement challenges. Complexity of mitigation measures listed in authorisations/on product labels – role for technology and/or digital labels here.

Area	Exposure driven dominantly by average field application rate	Spatial dependency = Exposure depends on application rate on treated area and proximity between exposure and risk assessment compartment
Groundwater Leaching	***	N/A
Surface water Runoff	**	***
Drainage	***	N/A
Drift	**	***
Soil		
In field	N/A	***
Off field	**	***
Non target terrestrial Organisms		
In field	N/A	***
Off field	**	***

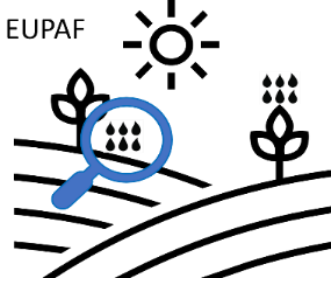
Areas of the risk assessment where exposure is driven by pesticide application rate predominantly, or in conjunction with spatial and ecological factors.

N/A = not relevant,
 ** sometimes relevant,
 *** always relevant task group 3+4



Take home messages

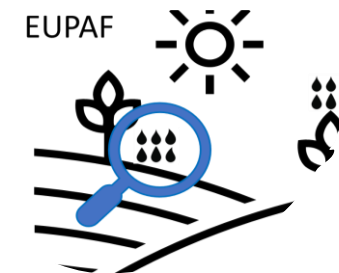
- Precision use categories are well-defined for field crops and reduction performances and classes can be estimated for current equipment.
- Language to describe a precision use in GAP tables can be defined and harmonised, completed with pictograms.
- Implications for the risk assessment are category-specific, for each area of concern. These can be defined and include the variables influencing the risk assessment
- The problem formulation can be designed as a tiered approach based on data availability risk assessment needs.
- Dialogue with regulatory authorities, farmers, crop protection industry, application technology stakeholders and academia is critical to integrate precision uses in the regulatory process. EFSA now establishing new EU Working Group.
- Case studies will illustrate and help to refine the approach proposed. They will be available on the EUPAF webpage.



Discussion

- How are is the pesticides risk assessed conducted in Moldova. What:
 - assumptions are made on the way products are applied?
 - Steps are taken to control exposures to: workers; consumers of treated produce; and those living close to treated areas;
 - Steps are taken to control exposures to: ground and surface waters; and plants and animals.
 - Steps are taken to ensure that there is no damage to the crops that are being protected and/or risk of resistance developing amongst the pests, weeds and diseases being controlled.
- Is there any appetite to adapt approaches to risk assessing pesticides and, if so, what processes would the Authorities in Moldova need to go through to do this?
- How might Authorities ensure that farmers can/do comply with label conditions that require pesticides to be complied in a precise fashion and that the Authority is able to enforce the requirements?

Thank you

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Web page:

https://www.bvl.bund.de/DE/Arbeitsbereiche/04_Pflanzenschutzmittel/01_Aufgaben/02_ZulassungPSM/05_psm_EUPAF/psm_EUPAF_node.html

Publications:

A. Alix, J. Schartner, B. Gottesbüren, P. Hloben, C. Kempenaar, P. Pagani, A. Steenbergh, 2025. Precision application of plant protection products in agriculture: role of the European Precision Application Task Force EUPAF, proceedings of the 15th European Conference on Precision Agriculture, Barcelona, 29June 3 July, ed J.V. Stafford, pp 1106-1113.

R. Isemer, B. Gottesbüren, E. Felkers, I. Christian, N. Mackay, M. Reed, R. Sur and D. Patterson
Precision Application: Risk Assessment Approaches and Potential as Risk Mitigation Measure. proceedings of the 15th European Conference on Precision Agriculture, Barcelona, 29June 3 July, ed J.V. Stafford, pp 1136-1142.

